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## **ABSTRACT**

An apparatus and method is disclosed for producing hydrocarbons according to the Fischer-Tropsch process. The apparatus comprises a catalytic distillation reactor where reactants are fed into the catalytic distillation reactor to undergo catalytic reaction to form hydrocarbons. Physical separation of the unreacted materials and products occurs simultaneously in the catalytic distillation reactor. The catalytic distillation reactor is divided into reaction chambers so as to optimize control of the reaction and the distribution of hydrocarbon products. External heat exchangers are provided for the recovery of the heat generated in the reaction.